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REPORT ON A TRIAL CHALLENGE INSPECTION

1. INTRODUCTION

In May 1991, Spain carried out a trial inspection in a civilian chemical plant in an attempt to comply with the rules that the Convention on the prohibition of chemical weapons will in time lay down for systematic inspections of declared facilities producing or capable of producing substances listed in Schedules 2 and 3.

The Government of Spain recently decided to take the steps necessary to carry out a trial inspection at a military facility according to the rules for challenge inspection at an undeclared facility. That is the subject of the present report.

Among the main objectives of that operation there naturally stands out that of testing the currently foreseeable provisions of the final text of the Convention. However, the inspection was also aimed at:

Defining with greater precision the competence of the National Authority regarding the organization and conduct of this type of inspection;

Identifying the real difficulties that the effecting of a trial inspection may cause at the national level;

Testing the challenging State's observer status under the Convention;

Acquiring experience in searching for and processing evidence of the existence of chemical warfare agents in a military facility;

Analysing the suitable composition of inspection teams;

Studying criteria applicable to the protection of the confidentiality of information provided to inspectors and to the security in general terms of the challenged country.

The participants in the inspection included, for purely learning purposes, a far larger group of military and civilian experts than that described in this report. Those purposes being considered internal to the Spanish armed forces, the report contains no detailed information on the activities of the persons in question, their assignment falling outside the scope of the Convention.

The provisions taken into account for the conduct of the inspection were those contained in the rolling text in document CD/1116.

2. PREPARATION FOR THE INSPECTION

2.1 Facility inspected

At the first preparatory meeting for the inspection, it was decided that the site selected should be one where conditions were as difficult and realistic as possible. Consequently, of the alternatives available, the choice finally settled on a naval base where, within an area of 400 hectares, there are 138 structures comprising above-ground and underground munitions dumps, laboratories, workshops, fuelling stations and health and logistical support facilities, as well as administrative buildings and living quarters. The site lies in a deep valley surrounded by high hills and open to the sea, with rolling terrain largely covered by trees. The entire perimeter is closed off by a fence and there are two road entrances and an exclusively military harbour.

2.2 Challenge

The ground on which the implementation of the inspection machinery was based was taken to be a challenge for possible storage and handling in the facility of munitions filled with chemical warfare agents, i.e. for breach of articles I and VI of the Convention.

The challenge specified the location of the suspect facility by means of broad geographical coordinates and references that did not relate strictly to the facility, but to the zone in which it lies.

2.3 Composition of the teams

2.3.1 Inspection team

A team leader with experience of CFE inspections;

A weapons engineer (chemist) from the La Marañosa National Factory with extensive knowledge of the Convention;

Two experts in CFE inspections;

An expert in nuclear, bacteriological and chemical (NBC) warfare and instructor at the Army NBC College.

2.3.2 Composition of the escort team

This team, which represented the National Authority, comprised:

A team leader with experience of CFE inspections;

An expert in NBC warfare and instructor at the Army NBC College;

A naval weapons engineer designated by the inspected facility;

Two experts in CFE inspections and arms control negotiations;

A chemist from the La Marañosa National Factory with expert knowledge of laboratory techniques;

A naval munitions specialist designated by the facility.

2.4 Observer from the challenged State

The person designated for this function was a nuclear engineer representing the General Directorate of Armaments and Equipment.

2.5 National observers

Although their presence is not provided for in the text of the Convention, the following persons participated, for learning purposes, as observers:

Two diplomats familiar with the text of the Convention;

Two representatives of the Ministry of Defence;

One representative of each verification cell from each of the three General Staffs.

3. CONDUCT OF THE INSPECTION

3.1 Prior stages

The sequence of events that triggered the inspection was taken to be the following:

The Director General of the Technical Secretariat notifies the Spanish Government of the existence of a challenge against Spain for possession and storage of chemical weapons in an undeclared facility identified by geographical coordinates;

The National Authority takes measures to facilitate the inspection team's entry to Spanish territory via the point of entry and sets in motion the machinery for the provision to the inspectors of escort and transport

services and assistance. The inspection team's arrival at the point of entry was assumed to have occurred within 24 hours of the notification to the Spanish Government;

At an initial coordination meeting between the inspection team and the Spanish authorities, the team spells out in greater detail the content of the challenge, its requirements for the inspection and the perimeter to which access is sought;

Simultaneously with this first meeting, the entrances to the perimeter requested by the inspection team are closed, except for one, chosen on a map provided by the National Authority, which is placed under surveillance by means of continuous video recordings;

Following the definition of the facility to which the challenge relates and the securing of the tentative perimeter, all participants in the inspection are flown to the airport closest to the zone containing the facility.

3.2 Negotiation concerning the perimeter and controlled access

The leader of the inspection team, the facility chief and the representative of the National Authority negotiated to reach agreement on the perimeter of the challenged facility.

In view of the geographical features of the terrain and of the need to apply the procedures and techniques of "controlled access" by the inspectors to the various buildings in the facility, thereby protecting effectively the security of the challenged State, the negotiation concerning the perimeter was assumed to be straightforward and the requested perimeter was made to match the agreed perimeter from the outset.

Immediately thereafter, and thus within the time-limit laid down in the text of the Convention, the inspection team was taken to the final perimeter.

To make the trial inspection as effective as possible while safeguarding the security of the facility, the next step was to define, within the agreed final perimeter, a system of controlled access defined as follows:

All the land entrances except one were kept closed, and a check was kept on entry and exit by goods vehicles via the only open such entrance and on berthings and sailings via the marine access;

Random access to the munitions tunnels, powder stores and workshops through the selection in each case of 20 per cent of the total, it being considered that the quantity chosen represented a sufficiently meaningful sample.

3.3 Inspection plan

On receiving the inspectors, the facility authorities conducted a briefing session and provided the inspectors with the following documentation:

1. A sketch map of the facility referring to all the significant elements within it;

2. A diagram of the wastewater system.

The authorities described the activities carried on within the facility and were simultaneously informed of the inspection team's logistical and administrative needs.

There followed a brief overflight of the perimeter immediately outside it in a helicopter without any type of sensor.

During the overflight, special attention was paid to the usable access points in the fence marking the perimeter of the facility.

The inspection plan was drawn up to allow for a maximum reasonable time for the inspection of 48 hours.

The members of the team, in keeping with the assumptions for the trial, were divided into the following groups:

A. Management of the inspection and visual inspection.

B. Taking, custody and, where appropriate, analysis of samples "in situ".

C. Surveillance of the perimeter and of the inside of the facility.

The management groups assignment was to go through the specified facilities, to look for evidence and to decide what samples should be taken and where they should be taken.

The sampling group's assignment was to go only to the points identified by the management group in order to take the samples requested by that group and to seal and guard those samples.

The assignment of the perimeter surveillance group was to monitor the exit of goods vehicles by the land access point and the marine access point and to check that the other land entrances and the perimeter fence remained closed.

The buildings and facilities that it was agreed to inspect were the following:

Above-ground powder magazines: one from each module in each group;

Munitions storage tunnels: two from each group;

Laboratories: reagents, documentation, instruments, analytical equipment;

Workshops: infrastructure, ventilation system, etc.;

Wastewater disposal and treatment system: sampling;

Waste treatment plant: sampling of the air and of suspect containers;

Fuelling station: non-fuel chemicals;

Fire service: equipment for the neutralization of chemical agents;

Medical service: drugs, casualty records for chemical agents, etc;

Library: books and documents on the use and storage of chemical agents.

The itinerary drawn up for the inspection group precluded the transfer of munitions from uninspected to inspected buildings.

3.4 Search for evidence

3.4.1 Munitions

The methods employed to investigate the presence of possible chemical agents in munitions were non-destructive.

The first step was to select and weigh various projectiles.

Then ultrasound was used to determine for each of them the thickness of their steel casing at various points.

On the one hand, these measures gave an idea of the inside shape of the projectile and on the other they provided information necessary for the subsequent gamma-radiographic examination.

This examination was made with the projectile placed at an inclination of 30° such that, had the charge been liquid, the horizontal surface line would have been detectable.

Once the gammagram was available, it was studied for the presence of cylinders, partitions, etc.

In any event, the gammagram made it possible to estimate the volume, and thus the weight of the metal section.

Deducting the weight of the metal section from the total weight of the projectile gave the weight of the charge; the volume of the charge being known, the final step was to deduce its density.

Had the density been between 1 and 1.5, there would have been grounds for suspecting the charge to comprise chemical agents and other, more conclusive types of test would have been made.

The non-destructive methods of analysis were supplemented by the taking of samples.

3.4.2 Facilities

As regards the search for evidence in other buildings and facilities, the procedure was as follows:

A search was made for the presence or otherwise of collective chemical protection systems such as water or air filters, the electrical capacity and installation were investigated, etc.;

In the munitions, gunpowder and explosives storage tunnels, the ventilation systems were also examined in a search for collective filters, and in conclusion air and powder samples were taken;

In the chemical laboratories, inspections were made of the equipment and reagents present and of the buildings' infrastructure;

In the workshops, checks were made of whether the tools and facilities could be used for the assembly, handling or filling of chemical munitions and whether the facility's structure and departments were capable of supporting such activities;

In the case of the fire service, a search was made for chemical protection and decontamination equipment;

In the infirmary, a search was made for evidence of the presence of antidotes to chemical warfare agents such as Oximas or any other pharmacological compound usable to treat lesions caused by chemical agents.

3.5 Collection of samples

Samples were taken in the places indicated and on the elements marked by the management group and all of them were held permanently in the custody of the sampling group.

All the samples were taken in duplicate, with one of them, after having been duly authenticated by the inspectors, being left in the control of the facility authorities.

3.5.1 Gaseous samples

For the samples of ambient air, use was made of a Gibson-type constant-flow pump with an intake of 1 litre/minute through tubes filled with activated charcoal into an 8 x 70 mm column.

The selective samples of gases in projectiles explosives canisters were taken with small-diameter (6 mm) glass tubes filled with 0.1 gr of TENAX- and XAD-2-type resins. The plug replacing the fuse in the projectile was unscrewed without removing it completely and the tube with the resin was inserted into the canister and 250 cc of air were slowly absorbed.

3.5.2 Liquid samples

Samples of waste water were taken in two different forms:

Volume of 200 cc in glass flasks with an airtight Teflon plug;

Volume of 1 litre through glass tubes filled with TENAX resin.

3.5.3 Solid samples

Depending on their origin, these were collected using two different procedures:

Samples of earth, solids, rubber, fabrics, etc., were taken by placing in glass tubes with airtight Teflon plugs small quantities of the substance together with a small amount of anhydrous potassium sulphate to reduce hydrolysis during transport;

Samples of stains on concrete which could not be extracted by scraping with a spatula were obtained by using cotton wool soaked in dichloromethane that was then placed in an airtight tube with anhydrous potassium sulphate.

3.6 Transport of samples

The gaseous samples were suitably packaged and transported in an icebox with Jelly-Ice.

The liquid samples were transported in glass flasks with the products separated into TENAX- and XAD-4-type columns.

The solid samples, like the others, were sealed and labelled with a code corresponding to the record made out for each sample.

3.7 Analysis of samples

The analyses were carried out in the NBC laboratory of the La Marañosa National Factory after the inspection and lasted two days.

3.7.1 Preparation of samples

The gaseous samples absorbed by the tubes of activated charcoal were extracted by the counterflow technique using 20 cc of dichloromethane and were then concentrated to 0.5 cc in a microconcentrator.

The liquid samples transported in glass bottles were passed by gravity through small glass tubes filled with 50 mg of XAD-4. After drying by centrifuging and the passage of dry nitrogen, they were extracted with 0.5 cc of ethyl acetate.

The solid samples were placed in a SOLHET extractor with 25 cc of dichloromethane. After being subjected to various extraction cycles, the solution was treated with anhydrous potassium sulphate and concentrated in a microconcentrator to a volume of 0.5 cc.

3.7.2 Qualitative analysis

The following methods were employed:

Gas chromatography with flame-photometric detector (GC-FPD);

Gas chromatography with selective mass detector (GC-MS);

Gas chromatography with infrared detector (GC-(FT)IR).

The first method is of high sensitivity for indicating the presence of agents containing sulphur or phosphorus.

The second is a more powerful means of identifying, with adequate precision, the compounds extracted.

In the event of the detection of a sufficiently high concentration of warfare agents in the sample, the most suitable method of confirming the result obtained by MS is considered to be GC-FIR analysis.

3.8 Taking of photographs

By prior agreement between the inspection team and the local authority, the photographs requested by the team were taken by personnel belonging to the facility. The camera was of the instantaneous development type and the photographs were taken in two copies, of which one was handed over to the inspection team and the other to the facility personnel.

Only photographs directly relating to disagreements arising during the inspection with regard to matters such as the capacity of ventilation systems, suitability of infrastructure, safety signs, etc., were taken.

4. ANALYSIS AND COMMENTS

4.1 Security of information

Meticulous preparation of the facility personnel and the escort team is necessary in order to avoid the disclosure of sensitive information and, at the same time, provide the information necessary for the inspection team to be able to do its work.

4.2 Composition of the inspection team

The number of inspectors will depend on factors that will vary with each facility, bearing in mind that the inspection must furnish the best possible guarantee of the non-presence of chemical weapons and that the inspection team should be kept as small as possible.

Account must be taken of the following:

In most cases, the inspection team will have to split into at least two subteams having similar or different functions and each comprising at least two inspectors;

Each subteam will have to have at least one assistant to help with record-making, the transport of equipment and the search for evidence.

4.3 Composition of the escort team

The escort team will have to have a technical capability equivalent to that of the inspection team so that it can serve as a competent interlocutor between the inspection team and the inspected facility.

There should be at least one of its members in each of the groups into which the inspection team divides.

Lastly, the escort team will have to manage all the support services and infrastructure needed by the inspection team.

4.4 Closing off of the perimeter of the facility

For understandable reasons of shortage of staff, and on the other hand, because of the need not to paralyse the activities of the facility, the closing-off and surveillance of the perimeter of the inspected facility turned out to be one of the inspection team's hardest tasks.

In the trial, control of the perimeter was achieved by closing and sealing all the access points in the perimeter except one, over which the inspection team exercised surveillance by making random checks of the goods vehicles entering or leaving the enclosed area.

In the trial in question, the ideal minimum number of staff assigned to the closing and controlling of the perimeter of the facility was set at four people, which, despite being a minimum figure, significantly increases (by almost 75 per cent) the ideal number of members of the inspection team, which may be estimated at about five.

While four men would have been sufficient in this case, it must be borne in mind that the military facility inspected on this occasion is perfectly delimited by the surrounding hills and by a well-nigh impenetrable fencing system and that there are very few vehicular entry or exit points.

4.5 Initial tour of the facility

In most cases, the initial tour of the facility will be of substantial assistance in drawing up the inspection plan, even though it may in some instances take a considerable amount of time.

Sometimes the value of a tour made by terrestrial transport may be small if it is not supplemented by observation from a point dominating the entire

facility or by a short overflight by helicopter; the latter is considered very useful both from the point of view of time-saving and because it enables the inspection team to set an overall idea of the facility without revealing details that the inspected State may wish to keep secret.

4.6 Taking of samples

Sample-taking is an arduous task that requires a great deal of time and therefore determines the rhythm of the inspection. Consequently, the inspection team should, if possible, be organized in such a way that the inspectors who are specifically concerned with sample-taking can begin their work as soon as possible and, if that can be managed, immediately following the initial tour of the facility after the team leaders have negotiated and agreed a mutually acceptable inspection plan with the authorities of the inspected facility.

Consequently, the inspection team's tasks should be flexibly organized so as to save time, even though that necessitates using more vehicles, means of communication and personnel, which will have to be supplied by the facility.

Each sample must be duplicated. This result can be achieved by simultaneous sampling by the inspection and escort teams using the same apparatus and procedures or by division of a single sample.

For each sample obtained, a record must be made out showing: the date, time and place of the taking of the sample; the procedure used to obtain the sample; the team employed; the type of sample; the inspector or technician who took the sample.

In many cases, sampling need not be destructive, since it is generally possible to determine whether a charge is chemical or not by means of sensitive non-destructive techniques.

The sampling groups must comprise one or two technicians from the inspection team, another from the escort team and at least one assistant to help with packing, registering, etc.

4.7 Analysis of samples

Only in very specific cases will the evidence found enable definitive conclusions to be reached without the need to analyse the samples taken.

Moreover, carrying out the analyses at the inspected facility will, as a general rule, be impossible for one of the following reasons:

The inspected State or the facility's process of work will not permit it;

There will not be enough time for the analysis during the period set for the inspection;

The facility will not have the right staff or instruments to carry out the analysis.

Lastly, it should be borne in mind, that although "in situ" analysis is very convenient, qualitative analyses undertaken under such conditions cannot be very reliable. It is preferable to take the samples to a laboratory and to analyse them there.

4.8 Photographs

The taking of photographs is one of the most delicate aspects of the security of the facility during the inspection and it must be ensured that it does not represent a breach of that security. For this reason, it is advisable that:

Photographs should be taken only of the documents or equipment that are needed as evidence in order to resolve a difference in interpretation;

In order to avoid unauthorized shots, photographs should be taken by the escort team at the request of the inspection team. Accordingly, the inspection team should not carry either still or video cameras;

The photographs that are taken should be made in two copies for the inspection and escort teams and should permit immediate verification, for which reason they should be of the instantaneous development type;

All the photographs taken should be attached to the inspection report and should be signed by the leaders of the inspection and escort teams, with an indication of the date, time and place of their taking and a brief description of what they show;

For the use of flash units in the taking of photographs, account should be taken of the safety regulations at the facility.

4.9 Reliability of challenge inspections

Recourse by a State party to the future Convention on the prohibition of chemical weapons to the challenging of another State party before the Organization on the basis of reasonable evidence entails a definite political risk deriving from, inter alia, the fundamental limitations of such inspection at a party's request.

Challenge inspection has, indeed, a conceptual limitation that derives from its nature, by virtue whereof there can only be certainty as to its result if the latter is positive, that is, if evidence is found of the current or past presence of chemical weapons.

It is obvious that proof of non-presence, however exhaustive the operation may be, always leaves room for doubt; hence, also, the fundamental differences proven by the experts of the Spanish armed forces between this

system of inspection in the Convention on Chemical Weapons and the similar systems in the CFE Conventions, in which the object is to verify the existence of various equipment.

In view of all this, it was possible to prove in practice through the trial what was already a virtual certainty before the trial was carried out: challenge inspection must be a last resort, being markedly political in nature, and the more closely the interests of the inspected State and the inspection team coincide - a coincidence based on the desire on the one hand to dispel the doubts affecting the security of the challenging State, and the existence on the other hand of an overwhelming desire to prove the "innocence" of the inspected State and thereby its proper fulfilment of the provisions of the Convention - the more reliable will be its result.

Subject to these conditions, the institution of challenge inspection will be totally effective and will fill the role expected of it within the framework of the overall system of verification and the Convention on Chemical Weapons.

4.10 Observer

As was foreseeable, the figure of the observer proved controversial and it was therefore agreed to restrict his access to and participation in the inspection to the strict limits compatible with his existence.

While the observer fulfils the important purpose of providing the challenging State with guarantees as to the efficiency with which the inspection team performs its duty, his constant presence in inspection activities is impossible because it transforms security problems into matters more important than the inspection itself and provokes on the part of the challenged State attitudes of excessive rejection and distrust that can vastly complicate an exercise of this nature.

Notwithstanding, the observer was informed, solely by the leader of the inspection team and/or the leader of the escort team, about all the aspects of the inspection, beginning from the time when the plan was drawn up until the preparation of the final report, and including all the intermediate stages.

The observer was prevented from having access to any type of documentation and to any of the facilities inspected and remained, with an escort, in a facility building until the operation was completed, with periodic reports being made to him on its progress.

4.11 Time-limits

In conclusion, emphasis must be placed on the importance according to Spain's experience as described in this report of time-limits during the initial stages of the conduct of a challenge inspection. This point may indeed be of such importance as to compromise the very reliability of the

results obtained. The time that elapses between the notification to the challenged State and the completion of the negotiations concerning the perimeter and the actual entry of the inspection team into the area where it is to begin its work must be kept to the minimum compatible with the resolution of the difficulties there are to be overcome: the negotiations concerning the perimeter, while probably the greatest problem and the greatest point of concern for legitimate security reasons, can be reduced in importance if it is borne in mind that controlled access techniques are an effective means of catering to those security concerns and can thus lessen the drama of negotiating the final perimeter.